REMARKS / ARGUMENTS

The present Amendment is in response to the Office Action mailed June 15, 2005. Claims 24-30, 35, 38, 41-42, and 44-46 are amended, and new claim 53 is added. Claims 24-53 are now pending in view of the above amendments.

Please note that the following remarks are not intended to be an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed below are presented solely by way of example to illustrate some of the differences between the claimed invention and the cited references. In addition, Applicants request that the Examiner carefully review any references discussed below to ensure that Applicants understanding and discussion of the references, if any, is consistent with the Examiner's understanding. Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

Examiner's Interview

Applicant's express their appreciation to the Examiner for conducting an interview with Applicant's representative on October 12, 2005. This response includes the substance of the Interview.

Claim Objections

The Examiner objected to claims 38 and 41. Claim 38 has been amended by deleting "said" in line three. The remaining instances of "said" are appropriate as they relate to the antecedent basis required for "at least some of the designated data blocks" recited in line 3 of claim 38. Claim 41 has been amended as required by the Examiner. Withdrawal of the objections to the claims is respectfully requested.

Claim Rejections Under 35 U.S.C. § 102

The Office Action rejected claims 24-52 under 35 U.S.C. § 102(b) as being anticipated by *Armangau* (U.S. Patent No. 6,434,681). Anticipation requires that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently

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described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, (Fed. Cir. 1987). The following discussion illustrates that *Armangau* does not satisfy *Verdegaal* with respect to claims 24-52. More particularly, because *Armangau* does not teach or suggest each and every limitation of the claims 24-52 as those limitations are set forth in claims 24-52, *Armangau* does not teach or suggest the pending claims.

Armangau is directed to a snapshot facility for a data storage system that permits continued host read/write access to data storage that has been snapshot copied. *See* col. 1, lines 5-10. As discussed at the interview, Figure 8A of *Armangau* illustrates the procedure invoked in response to a backup command from a host. *See* col. 16, lines 17-19. More particularly, Figure 8A illustrates a method for a backup of a production volume extent. Figure 8A illustrates that all of the tracks of the production volume extent are copied to the secondary storage in response to a backup command.

For example in Figure 8A, reference numeral 131 sets the track copy pointer to the first track of the production volume extent. Reference numerals 132 and 133 illustrate that all tracks for which a bit is not set in a bit map are copied to the secondary storage. Reference numerals 137 then copies tracks for which a bit was set in the bit map to the secondary storage from a snapshot volume. Figure 8A thus teaches that all of the tracks of the production volume extent have been copied to the secondary storage in response to a backup command.

When the snapshot facility taught by *Armangau* is invoked, there is no discussion regarding the state of the production volume extent that is being backed up. Figure 7A, for example, illustrates the teachings of *Armangau* related to the creation of a snapshot. Specifically, the creation of a snapshot begins by allocating the snapshot data structures, including a bit map and a list of pointers to snapshot tracks in the extent. *See* col. 15, lines 18-24. This is followed by inserting a pointer to the snapshot volume data structures. *See* Figure 7A. As discussed at the interview, *Armangau* does not teach or suggest ensuring that the data blocks are in a logically consistent state.

Claim 24 has been amended to require ensuring that the designated data blocks are in a logically consistent state such that the first point in time corresponds to a time when no activity exists on the mass storage device. Ensuring that the designated data blocks are in a logically consistent state provides the advantage of ensuring that a useable snapshot copy is always available. A logically consistent state, as described in the specification, by way of example, may

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indicate that internal data buffers have been flushed to the mass storage device, that the mass storage system is not in a state where data blocks are being updated, and the like.

As discussed at the interview, the allocation of data structures used for the snapshot at the creation of a snapshot as taught by *Armangau* does not teach or suggest ensuring that the data blocks are in a logically consistent state. In fact, the allocation of data structures, as taught by *Armangau*, suggests activity at the mass storage device rather than ensuring a logically consistent state such that no activity is present in the mass storage device as required by claim 24

For at least these reasons, *Armangau* does not teach or suggest all of the elements of claim 24 as set forth in claim 24. Claim 24 is therefore not anticipated by *Armangau* and is in condition for allowance. The dependent claims 29-34 depend from claim 24 and also overcome the art for at least the same reasons.

Independent claims 35, 41 and 46 have been similarly amended to require that the snapshot copy is created at a time when the data blocks are in a logically consistent state such that no activity is present on the mass storage device. For at least the reasons discussed above, claims 35, 41, and 46 are not taught or suggested by *Armangau* and are in condition for allowance. The dependent claims 39-40, 42-45, and 47-52 depend from claims 35, 41, and 46, respectively, and also overcome the art for at least the same reasons.

New claim 53 also requires ensuring that the data blocks are in a logically consistent state. In addition, claim 53 requires initiating an update of the snapshot copy by transmitting only those data blocks that have changed between the first time and the second time. Because the snapshot copy initially includes copies of the original data blocks, the snapshot copy only need be updated with copies of the data blocks that have changed in the time period between the first time and the second time. As a result, only copies of the data blocks that have changed in the time period between the first time and the second time are transmitted to the snapshot copy. In contrast to new claim 53 and as discussed above, *Armangau* teaches that all of the data blocks are transferred to the secondary storage.

For at least these reasons, new claim 53 is not taught or suggested by the art of record and is in condition for allowance.
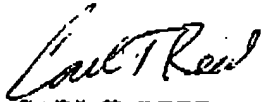
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Conclusion

In view of the foregoing, and consistent with the Examiner Interview, Applicants believe the claims as amended are in allowable form. In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, or which may be overcome by an Examiner's Amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 31st day of October 2005.

Respectfully submitted,

CARL T. REED
Registration No. 45,454
Attorney for Applicant
Customer No. 022913
Telephone: (801) 533-9800

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